

[12pt,aasms4]aastex The Dependence of the Galaxy Luminosity Function on Environment Daniel Christlein  
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 document titlepage Christlein Dependence of the GLF on Environment abstract We present luminosity functions for galaxies in loose groups in the Las Campanas Redshift Survey, differentiated by their environment (defined by the line-of-sight velocity dispersion  $\sigma$  of the host groups) and also by their spectral type (emission or non-emission, defined by the equivalent width of the 3727Å [OII] line). We find systematic variations in the Schechter parameters  $\alpha$  and  $M^*$  for non-emission line galaxies over a range of  $0 < \sigma < 800$  km/s:  $\alpha$  varies from 0.20 to -0.91, indicating an increase in the steepness of the faint end slope with increasing  $\sigma$ . The accompanying variation in  $M^*$  appears to be accounted for by the intrinsic correlation with  $\alpha$  and does not indicate a significant physical variation in the bright end of the luminosity function. For emission line galaxies, we find no significant systematic variation of the luminosity function with the environment. Our results show that emission and non-emission galaxies generally occupy two distinct regions in the  $\alpha$ - $M^*$  parameter space. From our luminosity functions, we derive the number ratios of emission to non-emission galaxies as a function of environment and absolute magnitude, showing that the relative abundance of non-emission line galaxies generally increases for all magnitudes  $-23 < M_R < -17.5$  towards high- $\sigma$  environments, from  $\sim 80\%$  to  $> 90\%$  at  $M_R = -22$  and from  $\sim 10\%$  to  $> 50\%$  at  $M_R = -18$  ( $H_0 = 100 \text{ km s}^{-1} \text{ Mpc}^{-1}$  and  $q_0 = 0.5$ ).